

The Airway Lead: opportunities to improve institutional and personal preparedness for airway management

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The coronavirus disease 2019 (COVID-19) pandemic of 2020 has taken many countries, leaders, and medical staff by surprise. The rapidity and severity of the infection overwhelmed many health systems. This virus, which attacks the respiratory system, put airway management centre stage. New approaches to airway management and intensive care were soon being proposed, and existing practice guidelines were rapidly adapted to cope with the risk of infection and the management of critically ill patients.

Reacting to such an event requires a multidisciplinary effort. Coordinating dissemination of new knowledge, supervising the procurement of airway equipment, overseeing morbidity and mortality audits, and promoting practice guidelines throughout the hospital are vital components of the response to such a crisis. These actions are also the principal roles of *Airway Leads* (AWLs). Their task is to enhance airway management throughout the organisation, engaging other specialties and support groups with the single goal of improving standards of care wherever airways are managed. This goal may be accomplished by the formation of an airway group or committee which can involve all those within a hospital with an interest or role in airway management. AWLs were not proposed as a response to the current crisis. An individual with the responsibility of promoting airway education was first suggested at the inaugural meeting of the Difficult

Airway Society (DAS) in 1996 (Adrian Pearce, personal communication).

Considerations of airway difficulty have traditionally focussed on anatomical difficulty. More recently the concept of the physiologically difficult airway has been introduced, most usually applied to managing the airway of the emergency or critically ill patients.^{1,2} However, logically we could expand the lists of types of airway difficulty to: (1) anatomical, (2) physiological, (3) logistical, and (4) educational.

The first two are well described and will not be discussed. Logistical difficulty also confronts airway practitioners and encompasses problems of the physical environment including working in a crowded or poorly designed ICU bed space, lack of appropriate equipment (whether an absolute absence or lack of availability in the necessary location at the necessary time) or lack of appropriate personnel secondary to staffing, workload, or rostering issues. Educational difficulty is a similarly diverse concept and includes (but is not limited to) failures of knowledge or its application relating to routine, emergency, or rescue airway techniques by the operator, their assistants, and wider team.

The Fourth National Audit Project of the Royal College of Anaesthetists and the Difficult Airway Society (NAP4) examined 184 cases of major airway complications in UK hospitals in anaesthesia, ICU, and Emergency Department (ED) settings.^{3–5} Examples of anatomical, physiological, logistical,

and educational airway difficulty were reported, often in combination, though this terminology was not used. The report highlighted the importance of human factors (now better referred to as human factors and ergonomics) in airway management safety. A small follow up study of NAP4 cases showed that human factors and ergonomics factors were legion and pivotal in all cases considered.⁶ The report made 168 recommendations directed at adult and paediatric, anaesthesia, emergency medicine, and intensive care specialties. Whilst these recommendations were diverse, they articulated the need for better preparedness in airway management. Airway preparedness can usefully be divided into two factors: institutional preparedness and individual or personal preparedness.

Consider the junior doctor working in a new hospital. The institution must provide the correct physical environment with up-to-date and fit for purpose airway equipment in all locations where an airway may be managed. The hospital should have appropriate staffing all day every day to manage predictable routine and emergency cases. There should be current evidence-based policies, standard operating procedures, or guidelines. Their existence should be communicated to staff in a structured manner via induction programmes, training days, and ideally simulation. Monitoring of staff to ensure familiarity should be in place and should be structured.⁷ Personal preparedness involves the individual practitioner undertaking appropriate knowledge acquisition and learning technical and non-technical skills. However, it goes much further and includes ensuring personal familiarity with that institution's policies, standard operating procedures and guidelines, familiarity with the location and content of emergency airway equipment, knowing the means of calling for help and responding to help when necessary, and engaging with induction, training, and simulation.

NAP4 made the specific recommendation that each hospital should have a Departmental AWL and this was endorsed by the Council of the Royal College of Anaesthetists (RCoA). Thereafter, a formal proposal was made to the RCoA and accepted.⁸ A year after its inception, the role was established in 95% of departments⁹ and it has remained at, or close, to 100% ever since. The joint position of an AWLs Advisor was created as a collaboration between the RCoA and the Difficult Airway Society, and the post-holder was tasked with the promotion and execution of AWLs activities at a local and national level. A year after the network was formed and 3 years after NAP4 was published, a survey of AWLs identified major changes in airway practices throughout the UK. As a result, 98% of hospitals had made changes in practice including closing the safety gap (the gap between ideal practice and actual practice based on NAP4 recommendations) of approximately 40% in anaesthesia, 50% in ED, and 60% in ICU.⁹

Although not specifically labelled a quality improvement initiative, these changes represent a very successful example of quality improvement on a national scale. The network has thrived since 2013. A website has been established, and biennial meetings have been well attended and have provided opportunity for shared learning, use of best practice examples, and collaboration. Examples include standardisation of airway trolleys,¹⁰ the tea-trolley approach to in-theatre education,¹¹ Tracheostomy Tracey,¹² and training programmes specifically for the clinical staff who assist the anaesthetist.¹³ Some groups of Departmental AWLs have joined together to create regional networks and as such, have implemented regional

change or harmonisation. Other groups of AWLs have been able to influence National Procurement airway decisions. The 2015 AWL meeting was instrumental in establishing (and naming) the 'no trace wrong place' campaign.^{14,15}

This year's AWL meeting in early March provided an opportunity to highlight the gathering storm of the coronavirus epidemic: delegates left the meeting fully aware of the impending threat with a plan to prepare.

The Departmental AWL concept has been successfully implemented in Ireland and in New Zealand¹⁶ and is in progress in Australia.¹⁷ There is interest in the programme in North America both in Canada and the USA, where airway response teams already exist.¹⁸ Quite rightly, each country has developed a program or network that suits its particular needs and challenges. However, the ethos of the AWL remains the same: someone who 'work(s) collegially with their colleagues to ensure appropriate systems are in place' and 'an airway lead is an anaesthetist working at grass roots level who promotes safe airway management within their hospital.'¹⁷

Despite the apparent success of the Airway Leads Network, there is no doubt that more needs to be done. Updates to devices, techniques, and guidelines are ever present and it is a challenge to an AWL to decide if, how, and when these should be introduced at a local level as it requires simultaneous education and training for many members of staff.¹⁹ Airway misadventure continues to occur and given the complexity of delivering safe airway management as described above this cannot be a surprise. The need for AWLs has perhaps never been more pressing and their role is central in disseminating learning from sentinel events in order to try to improve standards and patient care.

The purpose of an AWL is not to dictate how an individual anaesthetist manages a specific airway. Their role is to ensure that the individual anaesthetist has the tools to manage any airway they are faced with. In the aftermath of major airway events, AWLs provide a local support or signposting service to ensure clinician well-being while also sensitively coordinating airway morbidity and mortality review so that all anaesthetists and assistants and their departments can learn practical and institutional lessons or identify training needs. Anaesthetists are not the only physicians to manage airways, and the breadth of individuals doing so and the equipment used are ever expanding. An effective AWL will support airway management across the hospital group, ensuring a consistent approach is applied and standards maintained whenever and whoever manages the airway, whether in theatre, the emergency department, or ICU.

There are challenges facing the AWLs. How can they demonstrate their effectiveness? Should they be obliged or even mandated to provide regular airway training in their own hospitals? If so, who will provide the equipment required for training and create the time to allow departmental members to attend. Should there be a dictated standard as to what is taught? More broadly, can the Airway Leads Network be used to raise the overall standards of training in provision of airway practice across the country?

While actions to resolve these questions will have to be delivered locally, the decisions that support them need to be made nationally. In the authors' opinion advanced rescue airway management should become an item of mandatory training for all who wish to undertake independent airway management. In the UK, the RCoA's Guidelines for the Provision of Anaesthetic Services and Anaesthesia Clinical Services Accreditation programmes offer suitable mechanisms to

generate both individual opportunity and organisational compliance.

In the future, AWLs should contribute to a database of the most serious adverse anaesthetic events so that information can be effectively shared among all anaesthetists. This will require careful consideration of patient and practitioner confidentiality to allow appropriate dissemination of relevant learning points aimed at prevention rather than investigation. The RCoA-DAS emergency Front of Neck Access database due to be established later this year will be a first step towards this goal.

Airway management remains a cornerstone of our practice. The importance of skills in airway management and ventilation has been acutely illustrated since the onset of the COVID-19 pandemic. The advantages of working together and disseminating learning and advice quickly has never been more urgent. Existing guidelines have been adapted²⁰ and knowledge shared rapidly through networks. We believe the time has come for all institutions where airway management is practised to recognise the benefits of establishing and participating in an Airway Leads Network.

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Final approval of version to be published: all authors

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Manuscript preparation and critical review: PAB

Article oversight, revision of all drafts of the article: EOS

Declaration of interest

AFMcN is the Royal College of Anaesthetists-Difficult Airway Society (RCoA-DAS) Airway Leads Advisor. TMC is Airway Advisor to the RCoA and is an associate editor of the BJA. PAB is Chairman of the New Zealand Airway Leads Network and Vice President of the Society for Airway Management. EOS is a member of RCoA Council and a former President of the DAS.

References

- Mosier JM. Physiologically difficult airway in critically ill patients: winning the race between haemoglobin desaturation and tracheal intubation. *Br J Anaesth* Advance Access published on December 24, 2019. <https://doi.org/10.1016/j.bja.2019.12.001>
- Higgs A, McGrath BA, Goddard C, et al. Guidelines for the management of tracheal intubation in critically ill adults. *Br J Anaesth* 2018; 120: 323–52
- Woodall NM, Cook TM. National census of airway management techniques used for anaesthesia in the UK: first phase of the Fourth National Audit Project at the Royal College of Anaesthetists. *Br J Anaesth* 2011; 106: 266–71
- Cook TM, Woodall N, Harper J, Bengner J, Fourth National Audit P. Major complications of airway management in the UK: results of the Fourth national audit Project of the royal College of anaesthetists and the difficult airway society. Part 2: intensive care and emergency departments. *Br J Anaesth* 2011; 106: 632–42
- Cook TM, Woodall N, Frerk C. Major complications of airway management in the UK: results of the Fourth national audit Project of the royal College of anaesthetists and the difficult airway society. Part 1: anaesthesia. *Br J Anaesth* 2011; 106: 617–31
- Flin R, Fioratou E, Frerk C, Trotter C, Cook TM. Human factors in the development of complications of airway management: preliminary evaluation of an interview tool. *Anaesthesia* 2013; 68: 817–25
- Berkow LC, McNarry AF. Hospital and departmental organisation. In: Cook TM, Kristensen MS, editors. *Core topics airway manag*. 3rd Edn. Cambridge: Cambridge University Press; October 2020. <https://www.cambridge.org/core/books/core-topics-in-airway-management/7BFD17893146FC17F2AB98AA16FF588E>
- Cook TM, Woodall N, Frerk C, et al. The College department airway lead and NAP4 follow-up surveys: an announcement. *Bull R Coll Anaesth* 2012; 76: 37–8
- Cook TM, Woodall N, Frerk C. A national survey of the impact of NAP4 on airway management practice in United Kingdom hospitals: closing the safety gap in anaesthesia, intensive care and the emergency department. *Br J Anaesth* 2016; 117: 182–90
- McNarry AF, Patel A. The evolution of airway management-new concepts and conflicts with traditional practice. *Br J Anaesth* 2017; 119(suppl_1): i154–66
- O'Farrell G, McDonald M, Kelly FE. 'Tea trolley' difficult airway training. *Anaesthesia* 2015; 70: 104
- Riley E, Payne S, Jones J, et al. 'Trachy Tracey' - an education tool for tracheostomy training. *Anaesthesia* 2018; 73: 1044–5
- McNarry AF, Kelly FE, Cook TM, Rangasami J. Progress with airway leads. *Bull R Coll Anaesth* 2015; 90: 16–9
- Cook TM, Harrop-Griffiths W. Capnography prevents avoidable deaths. *BMJ* 2019; 364: l439
- Cook TM, Harrop-Griffiths AW, Whitaker DK, McNarry AF, Patel A, McGuire B. The 'No Trace=Wrong place' campaign. *Br J Anaesth* 2019; 122: e68–9
- Baker PA. *New zealand society of anaesthetists establishing a new zealand airwayleads network* 2019. Available from: www.anaesthesiasociety.Aorg.nz/about/networks/airway-leads-network. [Accessed 13 April 2020]
- Greenland KB. Introducing airway leads in Australia. *ANZCA Bull* 2019; 28: 22–5
- Mark LJ, Herzer KR, Cover R, et al. Difficult airway response team. *Anesth Analg* 2015; 121: 127–39
- Warnakulasuriya SR, Harvey R, McNarry AF. Translation of national guidelines into local practice. *Clin Teach* 2019; 16: 604–9
- Cook TM, El-Boghdadly K, McGuire B, McNarry AF, Patel A, Higgs A. Consensus guidelines for managing the airway in patients with COVID-19. *Anaesthesia Early View* published on March 27, 2020. <https://doi.org/10.1111/anae.15054>